



Topic Paper: Renewable Energy

Local Development Plan 2020-2035

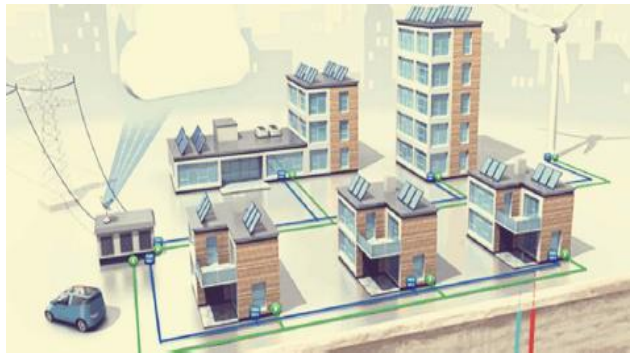


Belfast
City Council

Executive Summary

Context

- Renewable energy can be defined as energy sources which quickly replenish themselves and can be utilised time and time again, without detrimental environmental impacts upon their surrounding localities.
- The Renewable Energy Directive sets rules for the EU to achieve its 20% renewables target by 2020. Countries have all agreed to adhere to and reach this target.
- With regards to regional policy regarding renewable energy there are 3 key documents that provide over-arching analysis and advice on renewable energy:
 - RDS (Regional Development Strategy)
 - SPPS (Strategic Planning Policy Statement)
 - PPS 18 : Renewable Energy
- The Local Plan has the potential to act as a mechanism to best adopt policy that can help implement renewable targets for the city that aims to reduce carbon emissions, whilst encouraging the promotion of its citizen's to use renewable energy taking account of the impacts of climate change.
- Given the close relationship between the source, generation and consumption there should be a constructive debate, involving a wide range of stakeholders, over how, renewable energy systems such as solar or wind farms could be developed.
- Policies set out in the LDP will play an important role in achieving national targets for reducing CO2 emissions and encouraging the production of energy through renewable resources.
- Renewables are great for our energy portfolio because they are inexhaustible and won't pollute the planet for us or those of future generations by emitting toxic chemicals and gases.



Evidence Base	Renewable Model
<ul style="list-style-type: none"> ▪ As set out within the <i>Belfast City Centre – Regeneration and Investment Strategy, (2015)</i>, one of the core policies for the city is to increase the residential population. As population increases, this will no doubt lead to greater demands upon the need for more energy usage. ▪ From 1st Jan 2002 – 31st March 2015 there were 58 renewable energy applications approved within Belfast parliamentary district. ▪ Single wind turbines account for 80% of planning applications across the region from 2002-2015. <p><i>Key areas:</i></p> <ul style="list-style-type: none"> ▪ Promote the use of renewables across city ▪ Belfast Hills Area – siting and design aspects • Educate and promote -need for renewables 	<ul style="list-style-type: none"> ▪ The provision of energy supply including renewable energy involves a large number of stakeholders – DETI and NIE. ▪ Potential to promote sustainable design and construction standards for residential and commercial development. <div data-bbox="821 627 1412 1041" style="text-align: center;"> <pre> graph TD A[Empower citizens] --> B[Secure future energy provisions] B --> C[Invest in renewable energy] C --> D[Green economy] D --> A </pre> </div>
Social, Economic & Environmental Factors	Looking forward / Opportunities
<ul style="list-style-type: none"> ▪ There is potential for the integration of renewable technologies into the design, siting and layout of developments and promotion of passive solar design principles. – This could lead to job creation opportunities. ▪ Cumulative impacts arising from a number of single renewable turbine applications – such as the impact upon the surrounding Belfast and Castlereagh Hills. ▪ Local plan policy development process - ensure environmental, landscape, visual and amenity issues arising from, renewable energy developments are adequately considered. ▪ Promote a cleaner and more sustainable environment to live, work and socialise. 	<ul style="list-style-type: none"> ▪ A shift in focus from an application driven process for renewable energy to a more strategic planning policy driven approach which gives preferred sites best suited for renewable energy. ▪ Planning policy needs to promote potential new renewable technology sources such as biomass to help contribute to EU targets. ▪ Incorporate innovative energy production within the local streetscape and urban fabric. ▪ Policies which support application of medium / small scale renewable technologies (community, household). ▪ Recognise job growth potential in sector. • Promote sustainable design and construction standards (housing/commercial).

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1.0 Introduction

Purpose of this document

- 1.1. This is one of a series of 17 topic papers which have been put together to inform the Sustainability Appraisal Scoping Report for the Belfast Local Development Plan (LDP).
- 1.2. Each topic paper provides a summary of the evidence base required for the Sustainability Appraisal, Preferred Options Paper and Local Development Plan. They establish a baseline position and identify the key issues that need to be addressed.
- 1.3. By combining the evidence gathering stages for both the Sustainability Appraisal and Local Development Plan, we aim to streamline the documentation produced and avoid duplication. It will also help to ensure that sustainable development is embedded in the planning process and that sustainability appraisal is one of the main drivers informing the preparation of the Local Development Plan.
- 1.4. Each topic paper can be read separately but, inevitably, there are important related matters in other topic papers and background evidence.
- 1.5. The purpose of the planning system is to secure the orderly and consistent development of land to facilitate sustainable patterns of growth and development whilst protecting and, where appropriate enhancing the natural and man-made environment. To achieve this aim it is essential that the development needs of society are properly identified.

Member Workshops

- 1.6. A series of 17 Topic Papers were drafted in the early part of 2016 to provide elected members with baseline information to inform the preparation of the Local Development Plan. As such the information presented within this topic paper is intended to:
 - Build the capacity of the members to make informed planning decisions, particularly within the plan making context;
 - Provide baseline information which will inform Development Plan Policy making at a local level;
 - To link with important ongoing work in relation to the development of a Community Plan (the Belfast Agenda) and other strategic work being undertaken by the Council.
- 1.7. These papers were presented to members for discussion at a series of informal workshops with Planning Committee Members throughout the Spring 2016, with key issues and opportunities for the City identified for consideration.
- 1.8. It has since been updated to ensure the statistics referenced are up to date for publication alongside the Preferred Options Paper.

Renewable Energy

- 1.9. The Local Development Plan must seek to provide planning policies that will facilitate the conditions to move towards low carbon lifestyles. This will need to be achieved in line with the principles of sustainable development, ensuring that economic, social and environmental objectives are secured together.
- 1.10. Our current patterns of energy use are unsustainable and are having a huge impact in terms of contributing to environmental change, an insecure energy supply and fuel poverty.

The Government has recognised the need for change and is seeking an 80% reduction (from 1990 levels) in carbon dioxide emissions by 2050. Strong and early action is required, with an emphasis on reduced demand, energy efficiency and the promotion of low carbon technologies, particularly from decentralised energy sources.

1.11. A reliable and plentiful supply of renewable energy is vital if we are to cut greenhouse gas emissions in order to mitigate environmental change. To plan for the adoption of renewable energy technologies will bring significant benefits of greater energy security, tackling fuel poverty and improved air quality in the City. A secure and affordable energy supply is crucial to delivering economic and population growth. The dependence on imported fossil fuels is at odds with delivering future prosperity and well-being. There is a need to plan for sustainable forms of energy through investment in renewables.

1.12. Renewable energy can be defined as:

“..energy derived from natural processes (e.g. sunlight and wind) that are replenished at a faster rate than they are consumed. Solar, wind, geothermal, hydro, and some forms of biomass are common sources of renewable energy. Renewable electricity is therefore any electricity generated from any of these sources.” (International Energy Agency)

1.13. Due to increasing concerns regarding the availability of energy resources, the level of greenhouse gases emitted into the atmosphere, and the effect this has on the world's natural environment and climate; producing energy through renewable energy resources has become increasingly important. The production of energy in this way whilst protecting the environment is challenging. Policies set out in the LDP will play an important role in contributing to national targets for reducing CO₂ emissions and encouraging the production of energy from renewable resources.

2.0 Policy Context

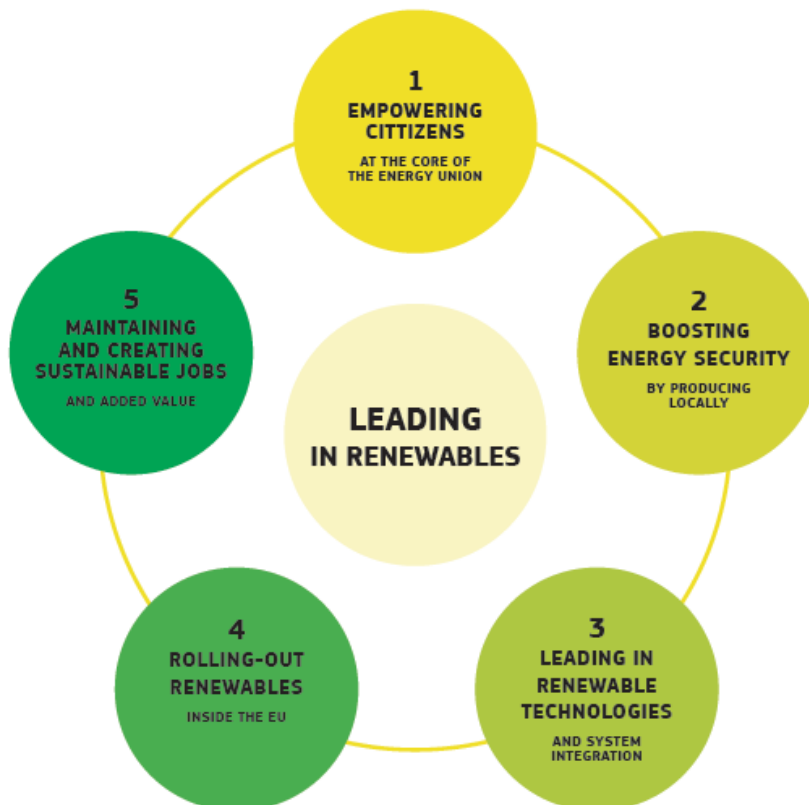
National / European Policy

- 2.1. The first global agreement on reducing emissions related to climate change came in Kyoto in 1992 (Kyoto Agreement), and since then national governments have been working in different ways to achieve a common aim. Long-term and interim targets can be difficult to understand on account of the many different ways of measuring progress and the huge number of contributory factors to global carbon emissions.

European Commission - Renewable Energy Directive - Directive 2009/28/EC: 23 April 2009

- 2.2. The directive “establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020.”¹ Progress in to meeting the 2020 national targets are measured every 2 years with the countries publishing the renewable energy progress reports. The illustration below is a synopsis of renewable energy and the benefits of countries adopting it as a method of producing green carbon friendly energy

MAKING THE EU WORLD NUMBER ONE IN RENEWABLE ENERGY: THE FIVE KEY AREAS



¹ www.ec.europa.eu/energy/en/topics/renewable-energy/renewable-energy-directive

Regional Policy

The Regional Development Strategy (RDS) 2035

- 2.3. The RDS recognises that Northern Ireland requires a robust and sustainable energy infrastructure. The Local Development Plan will have to balance potential impacts of renewable energy technology against the benefits from a secure energy supply, as well as the potential for improved air quality and sufficient energy generation capacity for industry and transportation. The RDS policy is to:
- 2.4. Deliver a sustainable and secure energy supply (RG5):
- **Increase the contribution that renewable energy can make to the overall energy mix.** There will need to be a significant increase in all types of renewable electricity installations and renewable heat installations, including a wide range of renewable resources for electricity generation both onshore and offshore to meet the Regions needs.
 - **Strengthen the grid.** With an increasing number of renewable electricity installations as well as increasing numbers of renewable heat installations we will need to strengthen the grid. It will be necessary to integrate heat and electricity infrastructure (e.g. district heating networks and new electricity grid) alongside new road infrastructure development at the planning stage. If electric transport becomes more widespread, there will need to be a reliable recharging network. It also means increasing electricity interconnection capacity to strengthen the linkages between transmission and distribution networks.
 - **Develop “Smart Grid” Initiatives.** This will improve the responsiveness of the electricity grid to facilitate new forms of renewable generation, to improve reliability, productivity, and energy efficiency and empower customers to make a more informed choice in relation to their energy usage.
- 2.5. RG9: Reduce our carbon footprint and facilitate mitigation and adaptation to climate change whilst improving air quality.
- 2.6. One of the aims within the environmental strand of the RDS, within RG9 is to ‘increase the use of renewable energies’. The Strategic Energy Framework for Northern Ireland 2010 sets a target of 40% of electricity consumption from renewable sources by 2020. ² In 2014 the target achieved by the region was 19.5% according to figures published by DETI. ³
- 2.7. Development consisting of infrastructure to provide renewable energy will be the subject of a Strategic Environmental Assessment or an Environmental Impact Assessment and measure up the impacts on environment against the sustainable benefits it carries.

The Strategic Planning Policy Statement

- 2.8. The SPPS sets out the Department’s regional planning policies for securing the orderly and consistent development of land in Northern Ireland under the reformed two-tier planning system. The provisions of the SPPS must be taken into account in the preparation of Local Development Plans, and are also material to all decisions on individual planning applications and appeals.⁴

² Regional Development Strategy 2035 – DRD 5th March: 2012 p47

³ www.out-law.com/en/articles/2014/october/first-northern-ireland-renewables-statistics-show-good-progress-towards-2020-targets-says-expert/

⁴ www.planningni.gov.uk/spps - p90-93

- 2.9. The SPPS reinforces what is discussed within the RDS that is to emphasise the need to increase contribution of renewable energy across the region. This commitment is also affirmed by the Department of Enterprise, Trade and Investment (DETI) strategic aim for a more secure and sustainable energy system.⁵
- 2.10. The policy also recognises that this sector is a growing worldwide sector; therefore it brings potential regionally for additional investment, employment opportunities whilst also aiming to improve health, welling being and quality of life to citizens.
- 2.11. The Strategic Planning Policy Statement aim for renewable energy:
- “is to facilitate the siting of renewable energy generating facilities in appropriate locations within the built and natural environment in order to achieve Northern Ireland’s renewable energy targets and to realise the benefits of renewable energy without compromising other environmental assets of acknowledged importance.”*
- 2.12. The Strategic Planning Policy Statement objectives for renewable energy are to:
- ensure that the environmental, landscape, visual and amenity impacts associated with or arising from renewable energy development are adequately addressed;
 - ensure adequate protection of the region’s built, natural, and cultural heritage features; and
 - facilitate the integration of renewable energy technology into the design, siting and layout of new development and promote greater application of the principles of Passive Solar Design.
 - Unacceptable adverse impact on the following planning considerations will result in renewable energy proposals from being approved:
 - Public safety, human health, ore residential amenity;
 - Visual amenity and landscape character;
 - Biodiversity, nature conservation or built heritage interests;
 - Local nature resources, such as air quality, water quality or quantity; and
 - Public access to the countryside
- 2.13. Proposals for wind turbine applications will be assessed under typical criteria such as;
- | | |
|--------------------------------------|-----------------------------------|
| • <i>access arrangements</i> | • <i>noise and shadow flicker</i> |
| • <i>road safety</i> | • <i>separation distance</i> |
| • <i>good design</i> | • <i>cumulative impacts</i> |
| • <i>communications interference</i> | • |
- 2.14. The Strategic Planning Policy Statement states that the Local Development Plan must take into account the aim and regional strategic objectives in preparing the Plan which shall support a diverse range of renewable energy development, including the integration of micro-generation and passive solar design. The Plan should consider local circumstances, and the wider environmental, economic and social benefits of renewable energy development.

⁵ Strategic Energy Framework for N Ireland 2010 - DETI

Existing Planning Policy and Supplementary Guidance

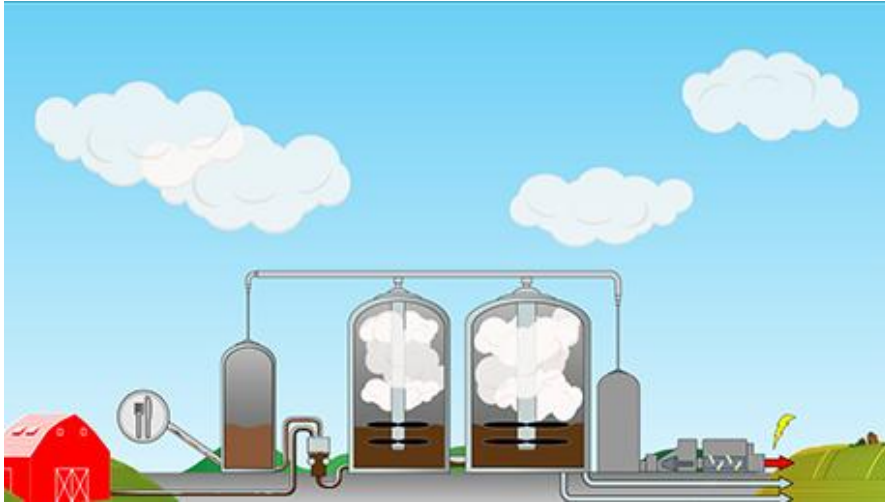
The relevant PPS's included PPS 18: Renewable Energy – DoE: August 2009 and PPS 18 Best Practice Guidance – DoE: August 2009

- 2.15. Planning Policy Statement (PPS) 18 sets out the planning policy for development that generates energy from renewable resources.
- 2.16. The PPS aims to facilitate the siting of renewable energy generating facilities in appropriate locations within the built and natural environments. The policy is accompanied by a Best Practice Guidance document which provides technical information and guidance on a range of renewable energy technologies as well as information about approaches to Passive Solar Design (PSD).
- 2.17. PPS 18 is also accompanied by Supplementary Planning Guidance (SPG), 'Wind Energy Development in Northern Ireland's Landscapes (August 2010). This document, published by the Northern Ireland Environment Agency, provides broad, strategic guidance in relation to the visual and landscape impacts of wind energy development. It includes general guidance on siting and design within Northern Ireland's landscapes and advice on the landscape assessment of proposed developments.
- 2.18. The objectives of the Statement are:
 - to ensure that the environmental, landscape, visual and amenity impacts associated with or arising from renewable energy development are adequately addressed;
 - to ensure adequate protection of the Region's built and natural, and cultural heritage features; and
 - to facilitate the integration of renewable energy technology into the design, siting and layout of new development and promote greater application of the principles of Passive Solar Design."⁶

Draft Supplementary Planning Guidance: Anaerobic Digestion – DoE: June 2013

- 2.19. This (SPG) document provides additional advice and guidance specific to Anaerobic Digestion (AD) to complement the background information already set out in the Best Practice Guidance to PPS 18. The information set out in this SPG should be read in conjunction with both PPS18 and its associated Best Practice Guidance. It has been drawn up taking account of similar material available for other parts of the UK and the Republic of Ireland.
- 2.20. AD is the process whereby organic material (plant and animal matter) is broken down by micro-organisms in a controlled, oxygen free environment (the anaerobic digester or 'bio-digester'). This produces a biogas (a mixture of methane and carbon dioxide) which is very similar to natural gas, and digestate, a nutrient rich residue made up of the undigested remnants of the feedstock that the micro-organisms cannot use.
- 2.21. The resultant biogas can be burned in a boiler or Combined Heat and Power (CHP) plant to generate renewable heat and/or electricity or may also be cleaned and used as a bio-fuel (sometimes referred to as biomethane) that may be injected into the gas grid to provide heat and power; or condensed for use as a renewable fuel for transport.

⁶ PPS 18 – Renewable Energy – DoE : Aug 2009 p1-6



2.22. The benefits associated with AD include:

- A contribution toward meeting Government targets in relation to renewable energy and greenhouse gas emissions;
- A beneficial means of dealing with biomass wastes that would otherwise go to landfill;
- The opportunity to utilise the Regions natural resources to enhance security of energy supply; and
- Support for jobs and businesses

2.23. With regards to assessing AD planning applications, PPS 18, PPS 11 (Waste Management) and depending on the location PPS21 (Sustainable Dev. in Countryside).

2.24. Electricity generated from bioenergy is 100% despatchable as opposed to wind and solar which are intermittent energy sources.

2.25. There is scope for smaller bioenergy units, at the edge of the council boundary and there was a recent council approval for an AD plant in the Titanic Quarter. These have the potential to supply both electricity to the grid and heating to the district. However, such projects can encounter local opposition on environmental grounds, especially if sited adjacent to residential areas. The two commons concerns would be fear of proposed smells / odours and potential increases in traffic flow.

Call for Evidence – Strategic Planning Policy for Renewable Energy

2.26. In April 2016, there was a call for evidence which gave council the opportunity to comment on all aspects of strategic planning policy for Renewable Energy; and how can strategic planning policy best assist with addressing potential amenity issues that may arise as a result of facilitating all types of renewable energy development (e.g. wind, solar, water (hydropower), geothermal energy, biomass)?

2.27. In considering Strategic Planning Policy for Renewable Energies, the Council's view is that the following are key areas of consideration:

- the range of technologies that could be accommodated and the policies needed to encourage their development in the right places;
- the costs of many renewable energy technologies are falling, potentially increasing their attractiveness and the number of proposals;
- different technologies have different impacts and the impacts can vary by place;

- we have statutory commitments to cut greenhouse gases and meet increased energy demand from renewable sources. Planning policy should therefore be designed to maximise renewable and low carbon energy development.

2.28. Moving forward there should be a shift in focus from an application driven process for renewable energy to a more strategic planning policy driven approach which gives preferred sites best suited for renewable energy.

Local Policy Context

Belfast Metropolitan Area Plan Strategy & Framework - Volume 1 (Part 3 Volume 1) Public Services And Utilities

2.29. Under this section of the plan it highlights the importance of society to think in a more sustainable approach. It directs towards policies set out within the planning policy statements and adjoining supplementary guidance.

- PPS 10 – Telecommunications
- PPS 11 - Planning and Waste Management
- PPS 15 - Planning and Flood Risk
- **PPS 18 - Renewable Energy**
- DCAN 14 - Siting and Design of Radio Telecommunications Equipment
- DCAN 12 - Planning Controls for Hazardous Substances

2.30. Emulating SFG5 of the RDS, BMAP 2015 recognises that the “Belfast Hills make a particularly important contribution to the setting of the Metropolitan Area, and extend for over 16 km from Lisburn, through Belfast, to Carnmoney Hill in Newtownabbey. They are regarded as one of Northern Ireland’s finest assets, and include a variety of landscapes, ranging from the pastoral farmland of the western slopes to the dramatic cliffs of Cavehill on the eastern side, together with the open expanses of the upland moors”.

2.31. Policy COU 8 – ‘Belfast Hills Access Points’ allows for development of limited access and small-scale interpretative/visitor facilities dependent upon proposals: improving access to the Belfast Hills; being small scale and integrating with the landscape; and having no adverse impact no adverse impact on the quality or character of the landscape.

2.32. Considering the importance of the Belfast Hills, any renewable energy developments proposed, in particular wind turbines should provide thorough evidence as to why it should be sited on the hills.

Energy Supply

2.33. The Department for the Economy (DE) is responsible for the Government’s strategy and policy relating to energy. DE published, ‘Sustainable Energy Action Plan 2012-2015 and beyond’ in May 2015. The action plan seeks to provide one single location where all the sustainable energy actions are brought together through all the Stormont Departments. ⁷

2.34. DE has overall responsibility for electricity and gas policy, legislation and delivery.

2.35. Given the level of cross-department responsibility, a Sustainable Energy Inter Department Working Group (SEIDWG) has been established and has recommended that energy functions should be amalgamated to have necessary legislative powers in one place, thus increasing accountability and streamlining internal processes.

⁷ www.detini.gov.uk/sites/default/files/publications/deti/Sustainable%20energy%20action%20plan%202012-15.pdf

- 2.36. Responsible Organisations: Table 1 The provision of energy supply including renewable energy involves a large number of stakeholders, they can be summarised as follows:

<i>Public Organisation</i>	<i>Area of Responsibility</i>
Department for the Economy	Regulatory role in relation to energy policy
NI Electricity (NIE) Network Ltd	Electricity asset owner of the transmission and distribution infrastructure
Mutual Energy Limited	Supplies electricity via the Moyle interconnector between NI and Scotland
SONI	System Operator for Northern Ireland Limited (SONI), a subsidiary of EirGrid Plc, holds the transmission system operator licence for Northern Ireland. SONI holds the SEMO operator licence for Northern Ireland, in conjunction with EirGrid.
SEMO	The Single Electricity Market Operator (SEMO) is the wholesale electricity market operating in the Republic of Ireland and Northern Ireland. It provides for a competitive, sustainable and reliable wholesale market in electricity, a joint venture between Eirgrid plc and SONI Limited.
Private Sector Companies	Wholesale Renewable Energy Generators

- 2.37. In the Belfast City Centre – Regeneration and Investment Strategy, September 2015, one of the core policies for the city is to increase the residential population. As the population increases across the city, this will no doubt lead to greater demands upon the need for more energy usage and the need to install and improve upon telecommunications.
- 2.38. Therefore, council should account for this within the LDP and aim to try and increase and offer energy supplies in the most sustainable approaches, which will also help address targets set by EU (EU Renewable Energy Directive - Directive 2009/28/EC) of achieving 20% energy consumption in 2020 through renewable energy. Stormont Executive has set a target of having 40% of electricity generation from renewables by 2020.

3.0 Renewable Energy Profile

3.1 The way energy is generated and used is being transformed: increasing the proportion of home-grown renewable generation, while using less through an energy efficiency revolution. Much of this will be led by large companies and major investors in our reformed energy market, but individuals and local communities can also make an important contribution to maintaining energy security, tackling climate change and keeping costs down for consumers.

The Strategic Energy Framework 2010-2020

3.2 The Strategic Energy Framework, prepared by DE In 2010, established a target of 40% renewable electricity consumption and of 10% renewable heat consumption to be achieved by 2020. The SEF Target for 2015 of 20% has been exceeded (23.7%) (16th February 2016 Renewables Grid Liaison Group, Minutes of Meeting Utility Regulator NI).

Review of the Costs and Benefits of the Northern Ireland Executive's 40% Renewable Electricity Target - Final report (DE 2015)

3.3 The review examined the potential impact of increasing renewable electricity generation on the NI economy. The purpose of increasing the generation of electricity from renewable sources is to decrease the use of fossil fuels in the power sector. The displacement of fossil fuel fired electricity generation by renewables will reduce Greenhouse Gas (GHG) emissions from the power sector. This will also reduce the emission of air pollutants which are associated with a range of detrimental impacts on human health, environmental health, property and the environment.

3.4 It identified a number of key economic benefits:

- Cost savings of between £94m/year and £145m/year in 2020, depending on level of renewable energy projects implemented, through reduced fossil fuel imports, CO₂ emissions and the air quality damage.
- Increases in employment of between 238 and 2,987 new jobs by 2020, depending on level of renewable energy projects implemented, worth between £52m/year and £315m/year to the NI economy.

3.5 It should be noted that the employment that could be created consists of mix of short term and long term jobs, and employment levels will decrease once construction phase is complete. However the benefits of reducing fuel imports and CO₂ emissions are likely to increase post 2020.

3.6 In 2013 DE developed a vision for future energy supply and demand in Northern Ireland in 2050, (Envisioning the Future Considering Energy in Northern Ireland to 2050, DE. The focus of the study was on the three key parts of the energy sector: electricity, heat and transport. It provides an indication of potential future supply and demand, though there are still uncertainties inherent in any long term vision. It envisages that electricity use would increase significantly, up by 44%. This is due to a predicted increase in electric vehicles (up to 80% of passenger km are in cars fuelled by electricity (direct or via hydrogen)), and switching from fossil fuels to electricity for heating buildings, either as direct resistive heating or for heat pumps. Electricity supply in 2050 sees a large shift to renewable energy generation, where the main potential increases are for onshore and offshore wind, with important increases in tidal stream, solar PV and large biomass. It envisages potential for district heating schemes in Belfast, to supply renewable heat from Biomass. This would potentially deliver energy related (electricity, heat and transport) .green house gas emissions reductions by 80% in 2050.

- 3.7 A robust and sustainable renewable energy infrastructure is required to maintain the City's global economic competitiveness and community resilience. This should deliver reliable and secure sources of renewable energy to communities and businesses across Belfast. It should be noted that major global businesses are now committed to securing 100% renewable energy supply between 2020 and 2030, (RE100 <http://re100.org/>.)
- 3.8 Energy security is a major issue, as the region is dependent on imported fossil fuels for its primary energy needs. Electricity is also imported from Scotland via the Moyle Interconnector. It is also proposed to develop the North-South Electricity Interconnector which is currently at planning stage. This will improve energy security of supply within the Island.
- 3.9 The region tends to have the highest utility bills of any region across the UK. In Northern Ireland small and medium size industries pay the second highest electricity cost in the EU. High fossil fuel dependency is prevalent with large percentage of homes in Belfast using oil for space heating. It is estimated that approximately 32% of households in Belfast face fuel poverty. (2011 House Condition Survey – District Council figures for key measures (modelled) NIHE, July 2014).
- 3.10 The decarbonisation of the power sector is the key to achieving emissions reduction targets. The NI Executive's the Strategic Energy Framework has a target of 40% electricity consumption from renewable sources and a 10% renewable heat target by 2020, in line with mandatory EU renewable targets. This is likely to mean an increase in the number of wind farms solar PV, tidal stream and bio-energy sources, and the grid infrastructure to support them. A renewable heat strategy is likely to require new renewable heat infrastructure to support it.
- 3.11 In March 2016, 22.2% of total electricity consumption in Northern Ireland was generated from renewable sources located in Northern Ireland. For the 12 month period April 2015 to March 2016, 25.4% of total electricity consumption in Northern Ireland was generated from renewable sources. This represents an increase of 5.5% on the previous 12 month period (April 2014 to March 2015). (NISRA)
- 3.12 Increasing renewable energy generation will reduce reliance on fossil fuels and improve security of supply. To build an outward-looking, dynamic and liveable City there needs to be significant investment in upgrading the electricity infrastructure, increasing opportunities for decentralised renewable energy generation, and exploring the potential to develop a renewable heat generation and distribution network.
- 3.13 There are a number of different types of renewable energy technologies available, some of the more common ones are listed below

Technology	
Wind turbines	<ul style="list-style-type: none"> • Established method for generating electricity • Come in a range of different sizes and designs making them suitable for different locations • Minimum distance required between buildings and other obstacles. Possible interference with radar and radio communications
Solar panels (photovoltaic or thermal)	<ul style="list-style-type: none"> • Silent and can have a low visual impact. Important that they are correctly angled to maximise their effectiveness.

	<ul style="list-style-type: none"> • Many schemes are 'permitted development' so do not require planning permission. • May not be suited to listed buildings or conservation areas.
Ground source heat pumps	<ul style="list-style-type: none"> • No visual impact Requires electricity to run Requires the right ground conditions
Air source heat pumps	<ul style="list-style-type: none"> • Some visual impact – similar appearance to air conditioning units • Easier to install than GSHP as does not require earth works
Biomass (wood chips or pellets)	<ul style="list-style-type: none"> • Can be a replacement to gas heating Wood chips/pellets can be easily sourced • Can impact on air quality
Anaerobic digestion	<ul style="list-style-type: none"> • Helps recycle waste products to produce electricity and heat
Tidal power	<ul style="list-style-type: none"> • Technology still in infancy has a large tidal range
Hydro power	<ul style="list-style-type: none"> • Technology deployed in water, i.e. rivers dams that can harness the power from fast flowing water.
Combined heat and power (CHP)	<ul style="list-style-type: none"> • Reduces carbon emissions Requires a fuel (fossil or biomass)
District energy network	<ul style="list-style-type: none"> • Can use a range of fuels, including waste heat from industrial processes. Ideally requires a mixed-use development in order to even out the demand for heat. • Simplifies maintenance as buildings do not require separate boilers. • Requires a high density development in order to be viable.

3.14 Some technologies will be better suited to particular areas of Belfast, for example, residential or industrial areas. Also, the impact of a particular technology will often depend on its size and design. The Local Development Plan will investigate opportunities to install renewable technologies in the city.

3.15 One of the easier technologies to install in an urban area is solar photovoltaic panels. They can function on any broadly south-facing roof or wall, and have few negative effects. They require daylight to operate and therefore generate more power in the summer than winter months. Many solar panel installations are now permitted development and therefore do not require planning permission anymore.

Decentralised District Energy Schemes

3.16 District energy allows for a transition away from fossil fuel use and can result in a 30–50 per cent reduction in primary energy consumption. Many cities are turning to district energy as key components of climate action plans. By reducing fossil fuel use, district energy systems can lead to reductions in indoor and outdoor air pollution and the associated health impacts. Linking the heat and electricity sectors through district energy infrastructure and utilizing

low-grade energy sources, such as waste heat or free cooling, can greatly improve the operational efficiency of new or existing buildings. All buildings require basic efficiency measures; however, as the efficiency in a building improves, connecting to a district energy system can be more cost effective than a full retrofit. Through economies of scale and the use of thermal storage, district energy systems are one of the most effective means for integrating renewable energy sources into the heating and cooling sectors. District energy also enables higher shares of renewable power production through balancing. Several countries with high shares of wind and solar power – such as China, Denmark and Germany – have begun using district heat systems to utilize excess renewable electricity during periods of oversupply. In Germany, a key reason that the national Energiewende (“Energy Transition”) policy promotes CHP is because it allows for the integration of higher levels of solar photovoltaics into the electricity grid.

- 3.17 District energy systems can boost resilience and energy access through their ability to improve the management of electricity demand, reduce the risk of brownouts and adapt to pressures such as fuel price shocks.

District Heating

- 3.18 Commercial properties particularly public sector offices are seeking opportunities to reduce their energy cost and cut their green house gas emissions. A potential district energy networks in parts of the city can be a cost effective solution.
- 3.19 District Energy systems produce Low Carbon energy from a central energy centre with steam or water distributed via insulated underground pipe work, often laid with a cooling and electricity network, to provide heat to communities for heating buildings and hot water. As a result, buildings served by a district energy system do not require their own boilers or chillers. District heating is commonly used in other countries (for example 60% of Denmark’s buildings use district heating) but currently it supplies less than 1% of buildings in the UK. District heating – whether using heat from a CHP or thermal only plant – is the most efficient way to heat closely grouped buildings using fuel and makes the conversion from fossil heating to renewable heating much simpler. District Energy is often coupled with Combined Heat and Power (CHP) plant and is widely recognised as a sustainable, cost-effective solution to the provision of heating, cooling and power which scores highly in BREEAM environmental assessments and facilitates compliance with Building Regulations Part L requirements.
- 3.20 A district heating network is a key element of enabling infrastructure that will allow a broader range of low carbon heat sources to be harnessed. For example, waste heat from industrial processes (such as distilleries and breweries) can be used to heat homes and businesses (as well creating additional income for the businesses supplying heat). Schemes may also incorporate other low and zero carbon technologies such as fuel cells, biomass, solar thermal, heat pumps, and high-efficiency gas-fired boilers
- 3.21 District energy networks are typically best suited in areas where there is a mix of different building types, so that there is demand for heat throughout the day. They would be particularly useful to incorporate into mixed use regeneration schemes in urban areas.

Community Energy Schemes

- 3.22 Fuel poverty is an issue in disadvantaged communities which have an effect on health and well being. Local communities developing their own renewable energy schemes can take ownership of reducing carbon emissions and saving money whilst enjoying the benefits locally. Putting communities in control of the energy they generate and use can have wider benefits such as building stronger communities fostering ownership and empowering communities to be involved; to secure the financial benefits; learning new skills, gaining experience and creating local jobs; and supporting local economic growth.

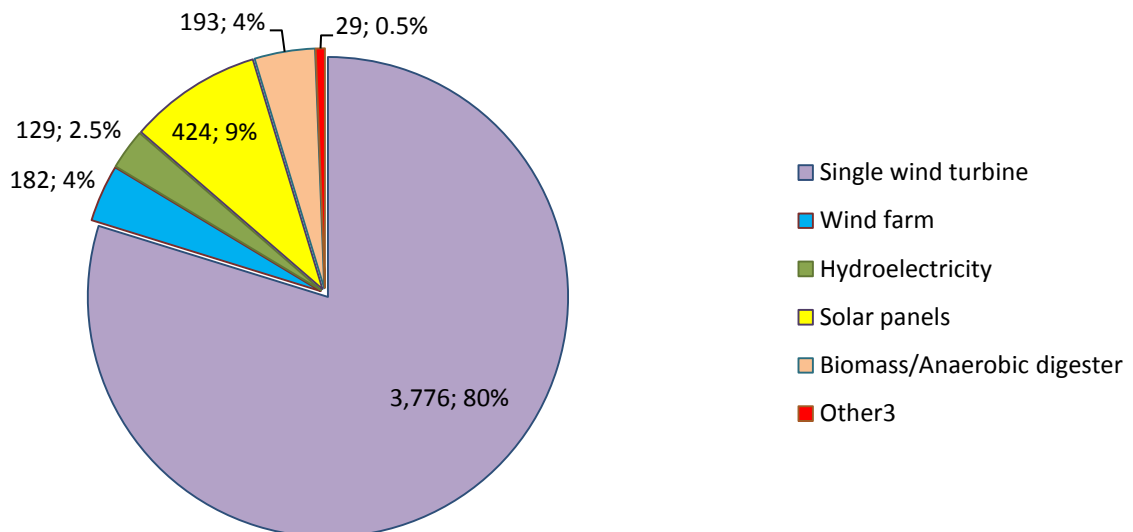
3.23 Community power projects are as diverse as communities themselves, and many are larger than 1MW. For example:

- In Hvide Sande in Denmark, local businesses associations have come together to ensure the town's economic vitality through the development of a wind farm that can produce 3 MW from each of its 3 turbines.
- Brixton Energy in the UK, which has undertaken three separate solar electric projects (producing 52kW, 45kW and 37.24kW respectively), places part of its profits into a community energy efficiency fund focused on energy and heat-saving improvements for inner-city residents. At the other end of the scale,
- WindPark Druiberg GmbH & Co. KG in Germany has the capacity to produce 66 MW of electricity, and uses its profits to invest in further local low carbon strategies.

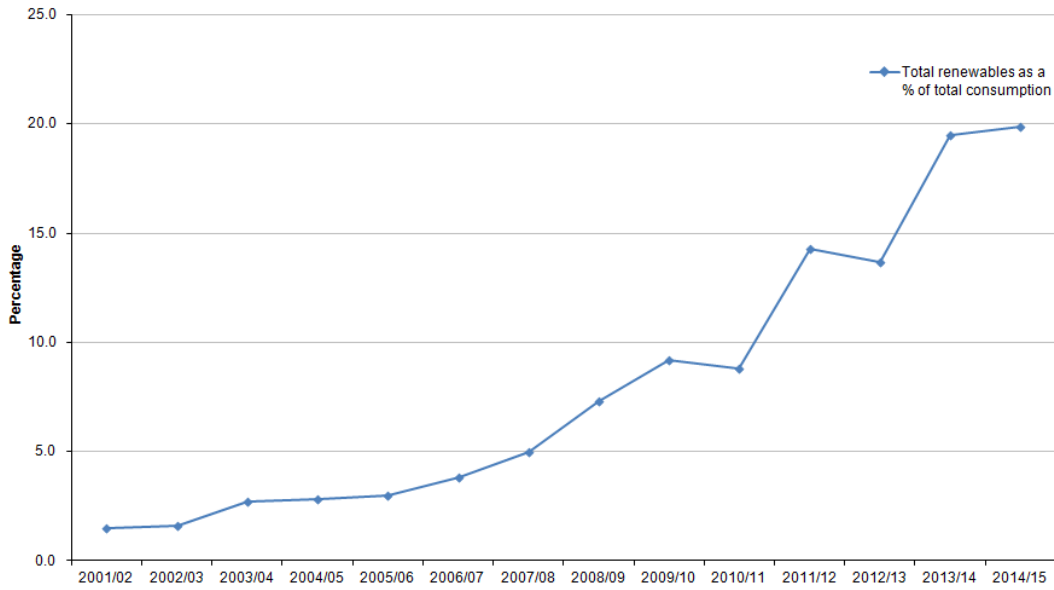
Renewable Energy: Applications

3.24 Below illustrates a pie chart showing the array of planning applications received across the region from 2002 – 2015. From the chart it is evident that over the last ten plus years single wind turbine applications has been the leading option for renewable energy gains.

Renewable Energy Applications Received Across the Region: 2002 - 2015

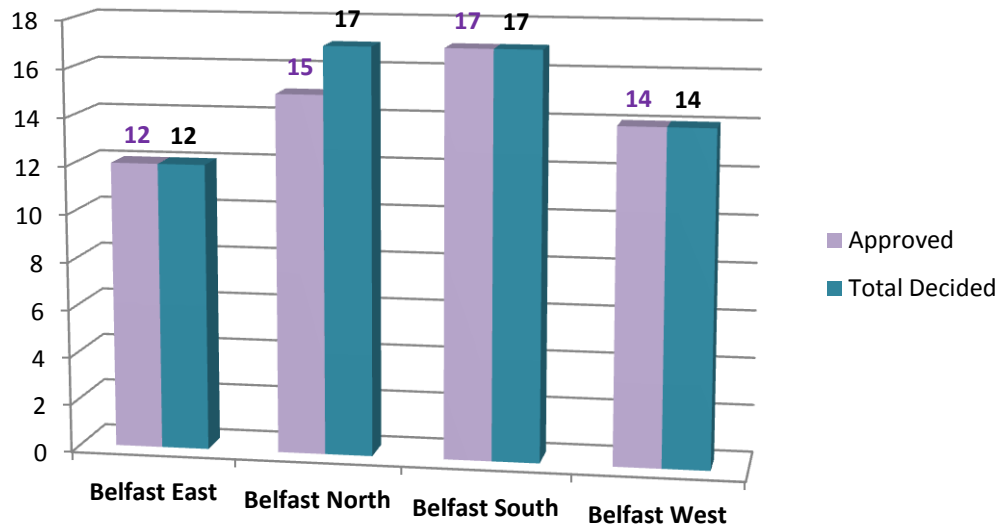


Renewable Energy Consumption across N Ireland: 2002 - 2015

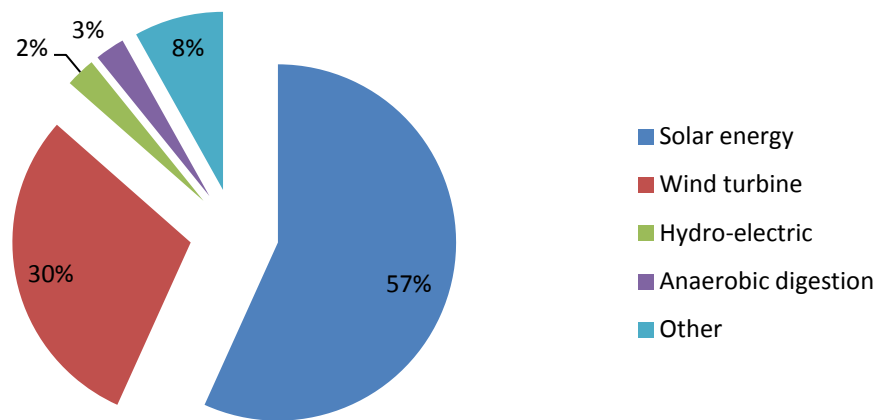


- 3.25 The graph above shows the about the total renewable consumption across the region, it can be seen over the last 4 years there has been a sharper rise due to public awareness.
- 3.26 The table below shows the number of renewable applications decided from the years 2002 – 2015 in each of the four parliamentary constituencies within Belfast.
- 3.27 The statistics published on the DI website, do not break down each to define what each type of renewable energy source was decided and approved, however, it would be expected that a large majority would be for solar panel installations. Overall, the number for the city is low in comparison to other parliamentary constituencies across the region.

Applications Decided on Renewable Energy Applications through Parliamentary District: 1st Jan 2002 to 31st March 2015



Applications Decided on Renewable Energy Applications through Local Government District: 1st Jan 2002 to 31st March 2015



Renewable Energy Type

Solar energy	21
Wind turbine	11
Hydro-electric	1
Anaerobic digestion	1
Other	3
Total	37

- 3.28 The above pie chart and table shows the number of applications decided for the local government district of Belfast between 2002-2015. As can be seen almost 60% were solar panels, with 30% wind turbine applications. Only 37 were approved, which would be deemed to be quite a low number in comparison to other district areas. The reasons for this would be that Belfast is predominately an urban area and therefore space for renewable energy and provisions of the correct terrain (wind energy) would be quite limited.

Case Study

- 3.29 A recent study in Scotland, focusing on people living near Scotland's first four wind farms also found that the closer people lived to wind farms the more positive was their attitude to them. 67% found 'something they liked' about the Scottish wind farms, rising to 73% amongst those living closest. Moreover, 74% found 'nothing they disliked' rising to 80% for those nearest.
- 3.30 Overall it seems that the Public's worries prior to construction were often unfounded - for example 40% of the 430 or so respondents in the Scottish survey said they thought that there would be a problems, but in the event only 9% reported any problems. Specifically, beforehand 12% though noise would be a problem, but afterward only 1% reported any disturbance.⁸

Co-Ops

- 3.31 Co-operative businesses are owned and run by and for their members, whether they are customers, employees or residents. As well as giving members an equal say and share of the profits, co-operatives act together to build a better world.
- 3.32 Co-operatives are a flexible alternative business model, which can be applied to renewable energy developments. They can be set up in different ways, using different legal structures, depending on what works for the members. The definition of a co-operative business is that they are owned and run by the members - the people who benefit from the co-operative's services.

⁸ www.eeru.open.ac.uk/natta/natta-guide.html

4.0 Issues and Approaches

- 4.1 The purpose of this paper has been to provide an overview of aspects relating to renewable energy across the council area. The information provided can help provide important elements to consider and appreciate when determining land use planning within the Local Development Plan.
- 4.2 Within the last 10 years renewable energy emerging as one of the fast growing industries and, it is crucial that with the demand for growth that the key issues of **Acceptance** and **Integration** of renewables into the local communities is addressed.
- 4.3 The future of renewables will depend on a wide range of technical, economic, environmental and political factors, as well as other policy concerns and political developments, nationally and internationally. Some of the key issues are the question of whether renewable energy can be relied on in the future, the security of supply and balance of payment problems that may face the UK when and if it has to import natural gas from overseas, the role of energy conservation, and the wider environmental issues relating to greenhouse gas emissions.



Decentralised energy generation and district heating

Issues

- Need to increase the contribution that renewable energy can make to the overall energy mix.
- Lack of planned infrastructure to develop renewable energy resources (including decentralised heat and power networks) as part of new development proposals, taking into account the site's characteristics and the existing heat and power demands on adjacent sites.
- Need to secure community engagement, to ensure that they can benefit from community renewable energy schemes to build resilient neighbourhoods.
- Potential lack of supply capacity to meet future demand for electricity could constrain population and economic growth.
- Increasing competition for fossil fuels from other countries and global oil price volatility creates an insecure energy supply.
- Industry pays the second highest electricity cost in the EU, making the region uncompetitive to inward investors who want a reliable and cost effective energy supply.
- High fossil fuel dependency is prevalent with large percentage of homes in Belfast using oil for space heating. It is estimated that approximately 32% of households in Belfast face fuel poverty. (2011 House Condition Survey – District Council figures for key measures (modelled) NIHE, July 2014).

Justification

- 4.4 The Local Development Plan should promote and support renewable energy technology where possible, The Council is keen to promote and embrace renewable energy technology as part of its image as a Low Carbon City. It would provide the City with a competitive advantage in helping to market Belfast as a Low Carbon Society and attract Companies that are committed to sourcing their energy supply from renewable sources. It would also provide secure energy supply that would help to improve air quality and potentially alleviate fuel poverty in Belfast.
- 4.5 The RDS requires local development plans to plan positively to deliver renewable and low carbon technology developments, to help tackle environmental change and to shift to a low carbon economy. This will help to meet the UK's legally binding target to reduce carbon emissions by 80% on 1990 levels by 2050.
- 4.6 Increasing the amount of energy from renewable and low carbon technologies will help to make sure that Belfast has a secure energy supply, reduce GHG emissions to slow down environmental change, improve air quality, and stimulate investment in new jobs and businesses. Also it is predicted that demand for electricity will grow over the next 35 years due to changing technologies in space heating and electric vehicles. The Plan is also predicting population and economic growth which will place a demand on the power supply. Planning has an important role in facilitating the delivery of new renewable and low carbon energy infrastructure in locations where the local environmental impact is acceptable. New generation or distribution infrastructure must be carefully planned and assessed to avoid adverse environmental effects, particularly on or near protected sites. There will need to be a balance between the potential impact on the built environment, and the benefits from a secure renewable energy supply, the potential for cleaner air and for economic growth.
- 4.7 With an increasing number of renewable electricity installations as well as the increasing numbers of renewable heat installations, the grid infrastructure will need to be strengthened. It will be necessary to integrate heat and electricity infrastructure (e.g. district heating networks and new electricity grid) alongside new road infrastructure development at

the planning stage. If electric transport becomes more widespread, there will need to be a reliable recharging network.

- 4.8 Local community groups and businesses have the opportunity to develop their own renewable and low carbon schemes to take ownership of reducing carbon emissions globally whilst enjoying the benefits locally. Developers, local community groups and businesses are encouraged to work with the Council in helping to reduce carbon emissions across the City.
- 4.9 The Council recognises significant progress needs to be made if national targets for the generation of renewable energy and reductions in GHG emissions are to be met. Policies will need to encourage the development of stand-alone renewable energy installations in the City. Development of all sizes should seek to make use of available heat, biomass and waste heat. New development should be designed to maximise the opportunities to accommodate a decentralised energy solution, considering density, mix of use, layout and phasing. All proposals will need to be considered on their individual merits with regard to scale, location, technology type and the cumulative impact on the surrounding area.
- 4.10 A strategic approach to renewable energy is advocated for, especially if they are to support targets set at EU level. There needs to be joined up partnerships with adjoining council areas as the siting, number and scale of renewable energy can impact on adjoining councils.
- 4.11 Belfast is highly reliant on imported energy and most of this energy is produced from fossil fuels. To meet targets for production of renewable energy, much more emphasis is now placed on the local sources of energy production and the required expansion of renewable energy generation.
- 4.12 Given the close relationship between the source, generation and consumption there should be a constructive debate, involving a wide range of stakeholders, over how, renewable energy systems such as solar or windfarms could be developed.
- 4.13 It is therefore suggested that the following considerations will be critical in the development of the LDP:
- (i) The local plan policy development process should ensure that the environmental, landscape, visual and amenity issues arising from, renewable energy developments are adequately considered.
 - (ii) Planning policy should consider policies to encourage the development and use of decentralised energy generation and district heating schemes in the urban area that would help to contribute to EU targets.
 - (iii) Consideration should be given to how cumulative impacts arising from a number of single renewable applications can be addressed within the strategic planning framework, in recognition of the potential impact over the full plan period on Belfast and surrounding areas.
 - (iv) The potential for the integration of renewable technologies into the design, siting and layout of developments and promotion of passive solar design principles.
- 4.14 The information contained within this topic paper has been used to inform the next stage of the LDP process, the Preferred Options Paper.

Table of Figures

Appendix A: Recent Wind Turbine Approval in Belfast

Z/2011/1050/F

- 55NW corner of the school building
- 147a Glen Road, St Marys CBGS, 147a Glen Road, Belfast
- Erection of a 31.5 metre in height wind turbine
- 0 letters of objection received

